

REMARKS

Claim 2 has been canceled. Claim 1 has been amended to incorporate the subject matter of claim 2. Thus, claims 1 and 3-8 are pending in the present application. No new matter has been added by way of the amendment to claim 1 (for example, see page 7, lines 6-10 of the present specification).

Based upon the above considerations, entry of the present amendment is respectfully requested.

In view of the following remarks, Applicant respectfully requests that the Examiner withdraw the only rejection and allow the currently pending claims.

Issues under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over Doms et al. (U.S. Patent Number 5,789,021; hereinafter Doms '021) in view of Arakawa et al. (U.S. Patent Number 4,574,102; hereinafter Arakawa '102). Applicant respectfully traverses.

The Present Invention and Its Advantages

Improved graininess and sharpness is desired and has been obtained in conventional radiation image conversion panels. However, when making such improvements, there are compromises such

as a decrease in the quantity of emission light, which leads to adverse effects from the change in signal-to-noise ratio. Thus, it is difficult to simultaneously obtain optimum quantity of emission light and a high-level graininess.

In contrast, the radiation image conversion panel of the present invention achieves greater density of stimuable phosphor in the phosphor layer as compared to conventional radiation image conversion panels. As a result of the present invention, a radiation image conversion panel having reduced graininess noise without decreasing the quantity of emission light is obtained.

Specifically, the present invention is directed to a radiation image conversion panel having at least two phosphor layers. Each of the phosphor layers has a stimuable phosphor and a binder, wherein the amount the binder to the stimuable phosphor in uppermost phosphor layer of the phosphor layers is greater than that of the binder to the stimuable phosphor in any of the other phosphor layers. The amount of binder to stimuable phosphor in the uppermost phosphor layer is greater by at least 0.5 wt% as recited in claim 1.

Other embodiments of the present invention include the different amount of binder to stimuable phosphor in the uppermost phosphor layer, the types of phosphor, thermoplastic elastomer, and

binder that could be employed, and the grain size of the stimuable phosphor.

Distinctions over the Combination of Doods '021 and Arakawa '102

The Examiner refers Applicant to portions of Col. 5 of the Doods '021 reference, and to portions of Col. 3 of the secondary Arakawa '102 reference. However, Applicant respectfully submits that a *prima facie* case of obviousness has not been established based on the asserted combination of Doods '021 and Arakawa '102.

U.S. case law squarely holds that a proper obviousness inquiry requires consideration of three factors: (1) the prior art reference (or references when combined) must teach or suggest all the claim limitations; (2) whether or not the prior art would have taught, motivated, or suggested to those of ordinary skill in the art that they should make the claimed invention (or practice the invention in case of a claimed method or process); and (3) whether the prior art establishes that in making the claimed invention (or practicing the invention in case of a claimed method or process), there would have been a reasonable expectation of success. See *In re Vaeck*, 947 F.2d, 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991); see also *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1316-17 (Fed. Cir. 2000); *In re Fine*, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

In other words, the cited references must disclose or teach all features as claimed. In addition, the references themselves must state the motivation or suggestion to combine the references, and one having ordinary skill in the art must reasonably expect to be successful in achieving the present invention upon reading the references.

In applying case law such as *In re Vaeck* and *In re Kotzab* to the present application, a *prima facie* case of obviousness has not been established. This is because the asserted combination does not even satisfy the first requirement for a *prima facie* case of obviousness. That is, the prior art does not teach or suggest all of the claim limitations.

As mentioned, the present invention employs an amount of the binder to the stimuable phosphor in the uppermost phosphor layer of the phosphor layers to be greater than that of the binder to the stimuable phosphor in any of the other phosphor layers by at least 0.5 wt%. This feature is not disclosed or suggested in either Doods '021 or Arakawa '102. Thus, the asserted combination instantly fails to satisfy the first requirement for a *prima facie* case of obviousness.

In addition, the feature of changing the amount of binder to the stimuable phosphor so that there is a difference in amount in the uppermost phosphor layer compared to the other phosphor layers

is a feature patentably distinguishable from the asserted combination of references. Applicant respectfully submits that such a feature is not mere optimization, but patentably distinguishable over the cited references.

In the Office Action, the Examiner states that the features of claim 2 and 3 are a matter of optimizing workable ranges (at page 4 of the Office Action). However, Applicant respectfully traverses such an unsupported conclusion, since no evidence has been provided indicating that it is routine skill in the art to have "an amount (by weight) of the binder to the stimuable phosphor in uppermost phosphor layer of the phosphor layers is greater than that of the binder to the stimuable phosphor in any other phosphor layers by at least 0.5 wt%", as instantly claimed.

Further, nothing in Doods '021 or in Arakawa '102 even suggests changing the amount of the binder to the stimuable phosphor in uppermost phosphor layer of the phosphor layers to be greater than that of the binder to the stimuable phosphor in any other phosphor layer by at least 0.5 wt%, or by 1 to 100 wt%. Thus, the asserted combination of Doods '021 and Arakawa '102 is still deficient in not reciting all of the claimed features of claim 1 and claim 3 (and all dependent claims thereon).

As stated in the specification, Applicant has focused on how the phosphor layer is divided into two or more layers having

different characteristics (page 5, lines 3-5). By employing the difference in amount of binder in the uppermost phosphor layer compared to the other phosphor layers, Applicant has achieved a desirable radiation image conversion panel having reduced graininess noise without decreasing the quantity of emission light.

These desirable characteristics and unexpected advantages such as improved S/N ratio of the present invention are also not disclosed by the cited Doms '021 and Arakawa '102 references.

Thus, the asserted combination of references does not provide the requisite motivation and reasonable expectation of success that one having ordinary skill in the art would need to achieve the present invention. Moreover, the cited references do not disclose or suggest the unexpected results of the present invention.

In other words, the other requirements for a *prima facie* case of obviousness have not been satisfied because one skilled in the art would not be motivated or reasonably expect to be successful by combining Doms '021 with the Arakawa '102 reference in achieving "an amount (by weight) of the binder to the stimuable phosphor in uppermost phosphor layer of the phosphor layers is greater than that of the binder to the stimuable phosphor in any other phosphor layers by at least 0.5 wt%" as instantly claimed. This is because one skilled in the art would not reasonably expect to be successful, or be motivated, in achieving advantages such as

simultaneous optimum quantity of emission light and a high-level graininess due to the claimed radiation image conversion panel. There is no disclosure in Dooks '021 or Arakawa '102 of such advantages of the present invention.

Thus, the only way to achieve the present invention is to read the present specification, then review what is being claimed, and using substantial hindsight reconstruction by combining reference A with reference B in the manner suggested by the Examiner. However, this reconstruction is contrary to case law when the USPTO has simply chosen elements from cited references after considering the instant disclosure to order to come up with the features of claim 1. The USPTO has, therefore, relied on an impermissible level of "hindsight reconstruction" as a basis of support of the instant rejection. As stated by the Federal Circuit in *Sensonics Inc. v. Aerosonic Corp.* 38 USPQ2d 1551 (Fed. Cir 1996):

To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction -- an illogical and inappropriate process by which to determine patentability. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).

Thus, Applicant respectfully submits that all requirements for a *prima facie* case of obviousness have not been satisfied, and that

impermissible, substantial hindsight reconstruction is the only way to achieve the present invention and its advantages.

Existence of Unexpected Results Rebut a *Prima Facie* Case of Obviousness

In addition, Applicant respectfully submits that the present invention has achieved unexpected results, where such unexpected results rebut any asserted *prima facie* case of obviousness. The present specification provides such unexpected results. As can be seen from Table 1 (at page 25 of the specification), the graininess noise can be reduced by a multi-layered phosphor layer having a larger amount of binder contained in the upper-layer phosphor layer.

For example, Example 1 of the present invention has 100% light emission quantity. Example 1 has an amount (by weight) of the binder to the stimuable phosphor in the uppermost phosphor layer of the phosphor layers which is greater than that of the binder to the stimuable phosphor in the lower phosphor layer by at least 0.5 wt% (as recited in claim 1). Simultaneously, there is no decrease in the quantity of light emitted from a phosphor. Thus, the present invention has produced a radiation image conversion panel having a desirable signal-to-noise ratio.

In contrast, Comparative Examples 1 and 2 do not increase the amount of binder contained in the upper-layer phosphor layer (also shown in Table 1), resulting in inferior graininess noise (i.e., 0.35×10^{-2} , versus 0.27×10^{-2} for Example 1 of the present invention).

Applicant submits that there is additional unexpected results that rebuts any asserted *prima facie* case of obviousness with regard to the combination of Doms 021 and Arakawa '102.

The Examiner refers the Applicant to Col. 3, lines 30-37, of Arakawa '102 for disclosure of changing the distribution of binder and phosphor. However, Applicant notes that even the storage panel of Arakawa '102 does not produce the unexpected results of the presently claimed radiation image conversion panel.

When the thickness of the single-layered phosphor disclosed by Arakawa '102 is increased to correspond to the total thickness of Example 1 of the present invention, the present invention still achieves an unexpectedly higher emission quantity and an unexpectedly lower graininess noise. As proof as these unexpected results, Applicant herein encloses a Declaration under 37 C.F.R. § 1.132 (wherein the inventor of the present invention attests to such unexpected results).

In the Rule 132 Declaration, Table 2 shows that Example 1 of the present invention has unexpectedly higher emission quantity and

lower graininess noise over the Comparative Example 3 (wherein Comparative Example 3 corresponds to the phosphor of Arakawa '102). Thus, by increasing the amount of a binder contained in the upper-layer of the phosphor sheet, the present invention has reduced graininess noise without decreasing the quantity of light emitted from the phosphor. Such unexpected results of the present invention are not observed in the single-layered phosphor of the Arakawa '102 reference.

Accordingly, Applicant respectfully submits that the present invention incorporates subject matter that is patentably distinguishable from the asserted combination of Dooks '021 and Arakawa '102. This is because a *prima facie* case of obviousness has not been established. Further, the existence of unexpected results further would rebut any asserted *prima facie* case of obviousness. Thus, Applicant respectfully requests the Examiner to reconsider and to withdraw the only rejection and allow the currently pending claims.

A full and complete response has been made to the Office Action. The Examiner is respectfully requested to pass the application to issue.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant respectfully petitions for a three (3) month extension of time for

filing a reply in connection with the present application, and the required fee of \$920.00 is attached hereto.

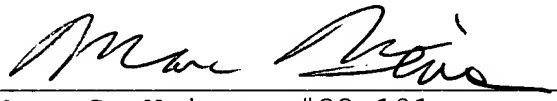
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Eugene T. Perez (Reg. No. 48,501) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

Declaration under 37 C.F.R. § 1.132

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT OF THE DISCLOSURE:

The Abstract of the Disclosure has been amended as follows:

There is provided a radiation image conversion panel having a sufficient quantity of emitted light and high graininess. The radiation image conversion panel ~~comprises~~ has a phosphor layer containing a stimuable phosphor and a binder. The phosphor layer ~~is comprised of~~ has at least two layers, and an amount or weight of a binder to a stimuable phosphor in an uppermost layer of the phosphor layer is greater than that of a binder to a stimuable phosphor in other layer than the uppermost layer.

IN THE CLAIMS:

Claim 2 has been canceled.

The claims have been amended as follows:

Claim 1. (Amended) A radiation image conversion panel comprising at least two phosphor layers each containing a stimuable phosphor and a binder, wherein an amount (by weight) of the binder to the stimuable phosphor in uppermost phosphor layer of the phosphor layers is greater than that of the binder to the stimuable phosphor in any other phosphor ~~layers.~~ layers by at least 0.5 wt%.

ABSTRACT

There is provided a radiation image conversion panel having a sufficient quantity of emitted light and high graininess. The radiation image conversion panel has a phosphor layer containing a stimuable phosphor and a binder. The phosphor layer has at least two layers, and an amount or weight of a binder to a stimuable phosphor in an uppermost layer of the phosphor layer is greater than that of a binder to a stimuable phosphor in other layer than the uppermost layer.